CAN RAP: A Program to Help Patients Choose a Screening Strategy for Colon Cancer

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The CANcer Risk Assessment and Preference (CAN RAP) system is a prototype computer program that helps patients to select a screening strategy for colon cancer. CAN RAP uses demographic and risk-factor information to calculate the benefit and cost of various screening strategies. The system communicates to patients these benefits and costs, and elicits patient preferences using audio, text, and graphics.

INTRODUCTION

Preventive services for the early detection of cancer are recommended by many organizations. Although some preventive services (e.g., Papanicolaou smears) clearly reduce morbidity and mortality, many others (e.g., colon-cancer screening) show modest or no benefit. In this latter class of preventive services, where the benefit and cost of screening are nearly equal, patients and physicians need to decide between the uncertain benefits of screening and the almost certain cost of patient time, money, risk, or discomfort.

To communicate to patients the benefits and costs of alternative colon-cancer–screening strategies, we designed the CANcer Risk Assessment and Preference (CAN RAP) program. CAN RAP elicits from the patient demographic and risk-factor information, presents individualized information on the benefits and risks of various screening strategies, asks patients to rank the alternatives according to their preference, and prints a summary for the physician (Figure 1). The current version of CAN RAP is a working prototype that has not yet been evaluated formally.

SYSTEM DESCRIPTION

CAN RAP was developed on a Macintosh computer using Claris HyperCard. When a session begins, CAN RAP asks the patient to enter information about demographics (name, age, gender), risk-factors (e.g., whether a family member has had colon cancer), and symptoms (e.g., whether he was had rectal bleeding). Based on the demographic and risk-factor information entered, CAN RAP uses a belief network–created with Noetic Systems Ergo–to calculate the patient's individualized risk of developing colon cancer. Specifically, Ergo uses family history of colon cancer, history of colonic polyps, and age to calculate a lifetime risk. The probabilities used in the belief network are obtained from the medical literature.

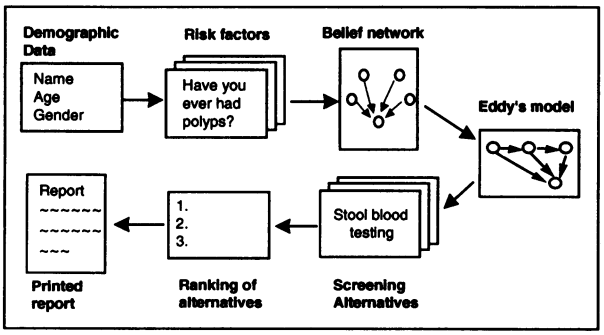

Figure 1. Overview of the CAN RAP system

Once the patient's lifetime risk of developing colon cancer is calculated, it is used to classify the patient's risk as low, intermediate, or high. Based on the patient's risk category, CAN RAP selects three screening alternatives to present to the patient. In all risk categories, the first strategy presented is *never screen for colon cancer.* The two other strategies are chosen based on the patient's risk. For example, patients with low risk are given the alternatives *yearly fecal occult blood testing* and *yearly fecal occult blood testing with sigmoidoscopy every 5 years.*

To calculate for individual patients the risks and benefits of various screening strategies, we modified a colon-cancer–screening model developed by Eddy [1] that calculates the costs and benefits of various testing strategies. Our belief network calculates the baseline probability of developing colon cancer, and Eddy's model calculates by how much each screening strategy will reduce that probability.

Once CAN RAP selects three screening strategies to present to the patient and calculates the expected benefits and costs, it presents this information to the patient. The first screening alternative, *never screen for colon cancer*, informs the patient about his chance of developing colon cancer should he decide not to screen for colon cancer. Two additional screening strategies are presented. For each strategy, the patient is instructed—through text descriptions, audio, and graphics—how each test in the strategy is performed, whether the test causes discomfort, and what are the expected benefits, costs and risks of the overall screening strategy.

After providing a summary of the benefits, costs, and risks of each screening strategy, CAN RAP assesses the patient's preference by asking the patient to rank the screening alternatives. Once CAN RAP elicits the ranking of screening alternatives, it prints a summary report for the physician.

Reference

[1]. Eddy DM. Screening for colorectal cancer. *Ann Intern Med* 1990;113(5):373.

0195-4210/92/$5.00